

هيئة التقييس لدول مجلس التعاون لدول الخليج العربية GCC STANDARDIZATION ORGANIZATION (GSO)

مشروع مواصفة نهائي
Final Draft of Standard FDS

إعداد اللجنة الفنية الفرعية الخليجية رقم 01 /TC 02/SC

Prepared by GSO Technical Sub-Committee No. TC 02/SC 01

GSO 02 /01/FDS/ 52 :2018

إطارات سيارات الركوب الجزء الثاني: المتطلبات العامة Passenger Car Tyres Part 2: General Requirements

ICS: 83.160.10; 83.160.01

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هذه الوثيقة مشروع لمواصفة قياسية خليجية تم توزيعها لإبداء الرأي والملاحظات بشأنها ، لذلك فإنها عرضة للتغيير والتبديل ، ولا يجوز الرجوع إليها كمواصفة قياسية خليجية إلا بعد اعتمادها من الهيئة.

تقديم

هيئة التقييس لدول مجلس التعاون لدول الخليج العربية هيئة إقليمية تضم في عضويتها أجهزة التقييس الوطنية في الدول الأعضاء ، ومن مهام الهيئة إعداد المواصفات القياسية واللوائح الفنية الخليجية بواسطة لجان فنية متخصصة.

قرر المجلس الفني لهيئة التقييس لدول مجلس التعاون لدول الخليج العربية في اجتماعه رقم () الذي عقد بتاريخ...../...../..... هـ ، الموافق/...../..... م اعتماد تحديث اللائحة الفنية الخليجية رقم GSO 52:2018 " إطارات سيارات الركوب الجزء الثاني: المتطلبات العامة " التي تم دراستها وإعدادها ضمن برنامج عمل اللجنة الفنية الفرعية الخليجية رقم TC 02/SC01 " اللجنة الفنية الفرعية الخليجية لمواصفات المركبات والإطارات " المدرجة في خطة دولة الكويت .
على أن تلغي اللائحة الفنية الخليجية رقم GSO 52:2007 و تحل محلها .

Passenger Car Tyres Part 2: General Requirements

1- SCOPE AND FIELD OF APPLICATION

This standard is concerned with the requirements of the new passenger car tyres and inflated with compressed air.

2- COMPLEMENTARY REFERENCES

- 2.1 GSO 51/2017 "Passenger Car Tyres - Part 1: Nomenclature, Designation, Marking, Dimensions, Load Capacity and Inflation Pressure".
- 2.2 GSO 53/2017 "Passenger Car Tyres - Part 3: Methods of Test".
- 2.3 GSO 1783/2017 "Passenger Car Tyres – Tread wear, Traction and Temperature Resistance Grading".
- 2.4 GSO 1784/2017 "Passenger Car Tyres – Methods of Testing of Temperature Resistance Grading".

3- DEFINITIONS

The definitions shall be in accordance with the Gulf Standard GSO 51/2017 as mentioned in item 2.1.

4- REQUIREMENTS

The following shall be met by passenger car tyres.

- 4.1 Appearance
It shall be free from apparent cracks or cuts or any foreign matter in the tread or on either of the sidewalls of the tyre. It shall not be contaminated with mineral oil, and the tread shall be even and no exposed ply cord shall be apparent to the tyre.
- 4.2 Dimensions, Load Capacity and Inflation Pressure
 - 4.2.1 The dimensions, load capacity and inflation pressure shall be in accordance with Gulf Standard mentioned in item 2.1.
 - 4.2.2 The dimension shall be in metric system.
 - 4.2.3 Section Width of a Tyre
 - 4.2.3.1 The section width shall be calculated by the following formula:
 $S = SN + K (r-r_{th})$,

where:

S is the "section width" rounded to the nearest millimetre and measured on the measuring rim;

SN is the "nominal section width" (in mm) as shown on the side wall of the tyre in the designation of the tyre as prescribed;

r is the width (in mm) of the measuring rim, as shown by the manufacturer in the descriptive note;

(When the conventional number is given by codes, the value in mm is obtained by multiplying such number by 25.4).

r_{th} is the width (in mm) of the theoretical rim; (see Paragraph 3.29 of GSO 51/2017).

*Note: The theoretical rim width (' r_{th} ') equals:
 $0.7 * (SN)$ for tyres with Nominal Aspect Ratio 50 and larger.
 $0.85 * (SN)$ for tyres with Nominal Aspect Ratio 45 and smaller.
 $0.67 * (SN)$ for 'CT' tyres.
 $1 * (SN)$ for 'A' or 'U' metric tyres.*

K shall be taken to equal 0.4.

4.2.3.2 For tyres identified by the "tyre to rim fitment configuration" Metric "A", or "U" tyre, K shall be taken equal to 0.6.

4.2.4 Tyre Section Width Specifications

4.2.4.1 The overall width of a tyre may be less than the section width determined pursuant to paragraph 4.2.3.1 above. However, it may exceed that value by the following percentages, whereby the limits shall be rounded to the nearest mm:

4.2.4.1.1 6% for diagonal (bias-ply) tyres:

4.2.4.1.2 4% for radial, run flat tyres:

4.2.4.1.3 If the tyre has special protective ribs or bands, the overall width may be exceeded by 8 mm.

4.2.4.1.4 If the tyre is an "A" or "U" metric tyre, the overall width in the bead area shall not exceed the nominal rim width increased by 20 mm.

4.2.5 Outer Diameter of a Tyre

4.2.5.1 The outer diameter of a tyre shall be obtained by means of the following formula:

$$D = d + 2H$$

where:

D is the outer diameter (in mm);
d is the Nominal Rim Diameter (in mm) defined in paragraph 4.3 of GSO 51/2017;

H is the nominal section height rounded to the nearest millimetre and equals to:

$$H = 0.01 * \text{Nominal Section Width (SN)} * \text{Nominal Aspect Ratio (H/SN)}$$

all as shown on the sidewall of the tyre in the tyre-size designation.

4.2.6 Tyre Outer Diameter Specifications

The outer diameter of a tyre must not be outside the values D_{\min} and D_{\max} obtained from the following formulae:

$$D_{\min} = d + (2 * H_{\min})$$

$$D_{\max} = d + (2 * H_{\max})$$

where:

$$H_{\min} = (H * a) \text{ rounded to the nearest mm}$$

$$H_{\max} = (H * b) \text{ rounded to the nearest mm}$$

4.2.6.1 For tyres identified by the "tyre to rim fitment configuration" Metric "A" or "U" tyres, the nominal section height H is equal to: $H = 0.5 (D-d)$, rounded to the nearest mm. (For references see paragraph 4.2.5.1 above).

4.2.6.2 Coefficients "a" and "b" are respectively:

4.2.6.2.1 Coefficient "a" = 0.97

4.2.4.6.2 Coefficient "b"

Coefficient "b"	Radial, run flat tyre	Diagonal and Bias Belted
for normal tyres	1.04	1.08
for special-use tyres	1.06	1.09

4.3 Tensile Strength and Elongation

The tensile strength of tread rubber shall not be less than 1.2 kg/mm², and the elongation shall not be less than 300%.

- 4.4 Ageing
The tensile strength of tread rubber shall not be less than 80% of the tensile strength of the sample before continuous ageing for 96 hrs at $(70 \pm 1)^\circ\text{C}$.
- 4.5 Strength
The breaking energy of each tyre shall not be less than the values specified in Table (1) when tested in accordance with the Gulf Standard [GSO 53/2017](#) as mentioned in item 2.2.

TABLE 1
Minimum Breaking Energy Values (J)

Nominal Section Width and Body-Ply Cord Material	Diagonal (bias-ply) Tyres			Radial Tyres		Diagonal T-type Temporary Use Tyres	
	Ply rating			Standard	Reinforced Extra Load	Load Index	
	4	6	8			≤ 75 (387 kg)	≥ 76 (400 kg)
Below 160 mm							
Rayon	113	212	282	113	282	113	186
Other than rayon	220	330	441	221	441	221	295
160 mm and above							
Rayon	186	280	373	186	373	113	186
Other than rayon	294	441	588	295	588	221	295

- 4.6 Endurance
- 4.6.1 When the tire has been subjected to the laboratory endurance test specified in accordance with the Gulf standard [GSO 53/2017](#) as mentioned in item 2.2. using a test rim that undergoes no permanent deformation and allows no loss of air through the portion that it comprises of the tire-rim pressure chamber:
- (a) There shall be no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.
- (a) The tire pressure at the end of the test shall be not less than the initial pressures measured before the test
- ~~4.6.1 There shall be no evidence of tread, sidewall, ply, cord, inner liner, belt or bead separation, chunking, open splices, cracking or broken cords after the tyre has been subjected to the endurance test specified in accordance with the Gulf standard mentioned in item 2.2.~~
- ~~4.6.2 The tyre pressure measured immediately after the test shall not be less than the initial pressure measured before the test.~~
- 4.7 High Speed Performance

4.7.1 When the tire has been subjected to the laboratory endurance test specified in accordance with the Gulf standard mentioned in item 2.2. using a test rim that undergoes no permanent deformation and allows no loss of air through the portion that it comprises of the tire-rim pressure chamber:

(a) There shall be no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

(b) The tire pressure at the end of the test shall be not less than the initial pressures measured before the test.

~~4.7.1 There shall be no evidence of tread, side wall, ply, cord, inner liner, belt or bead separation, chunking, open splices, cracking or broken cords after the tyre has been subjected to the high speed endurance test specified in accordance with the Gulf standard mentioned in item 2.2.~~

~~4.7.2 The tyre pressure measured immediately after the test shall not be less than the initial pressure measured before the test.~~

4.8 Bead Unseating Resistance [tubeless tyres]
When a tubeless tire that has a maximum inflation pressure other than 420 kPa is tested in in accordance with the Gulf standard GSO 53/2017 as mentioned in item 2.2, the applied force required to unseat the tire bead at the point of contact shall be not less than the following values:

Nominal section width, SN (mm)	Force (N)
SN < 160	6670
160 ≤ SN < 205	8890
SN ≥ 205	11120

For Diagonal T-type Temporary Use Tyres

Tyre load index, LI	Force (N)
75 (399 kg) and below	6670
76 (399 kg) ≤ LI ≤ 92 (635 kg)	8890
LI > 92 (635 kg)	11120

4.9 Tread Pattern of a Tyre

4.9.1 In order to be classified as a "special use tyre" a tyre shall have a block tread pattern in which the blocks are larger and more widely spaced than for normal tyres and have the following characteristics:

- (a) A tread depth ≥ 11 mm
- (b) A void-to-fill ratio ≥ 35 per cent

4.9.2 In order to be classified as a "professional off-road tyre", a tyre shall have all of the following characteristics:

- (a) A tread depth ≥ 11 mm;

- (b) A void-to-fill ratio ≥ 35 per cent;
- (c) A maximum speed rating of $\leq Q$."

4.9.3 Tread Wear Indicators

4.9.3.1 Each tyre shall have at least six transverse rows of wear indicators, approximately equally spaced and situated in the principal grooves of the tread. The tread-wear indicators shall be such that they cannot be confused with the rubber ridges between the ribs or blocks of the tread.

4.9.3.2 Tyres designed for mounting on rims of nominal rim diameter code 12 or less, not less than four traverse rows of tread wear indicators are acceptable.

4.9.3.3 The tread-wear indicators must provide a means of indicating with a tolerance of $+0.60/-0.00$ mm, when the tread grooves are no longer more than 1.6 mm deep.

4.9.3.4 The height of tread-wear indicators is determined by measuring the difference between the depth, from the tread's surface, to the top of the tread-wear indicator and to the bottom of the tread groove close to the slope at the base of the tread wear indicator.

4.10 Speed Symbol

4.10.1 The speed symbol shall be marked on the tyre, and it shall be as indicated in Gulf standard mentioned in item 2.1.

4.10.2 The speed symbol marked on the tyre shall be 'S' or higher, except in case of 'Temporary Use' spare tyres where it shall be M or higher.

4.10.3 The speed symbol marked on the professional off-road tyre (POR) shall be 'P' or 'Q'.

4.11 Temperature Rating

4.11.1 Each tyre shall be graded for temperature resistance grade in accordance with the Gulf mentioned in item 2.4.

4.11.2 The temperature rating of passenger car tyres shall be "A" or "B".

4.11.3 The temperature resistance performance shall be obtained when testing the tyres in accordance with the Gulf standard mentioned in item 2.5.

5- MARKING

The marking of the tyre shall be in accordance with Gulf Standard [GSO 51/2017](#) as mentioned in item 2.1.

6- TRANSPORTATION AND STORAGE

- 6.1 Tyres shall be transported in such a way so as to protect it from damage and shall be stored away from sunshine, rain and moisture, oil or grease, and heat or any apparatus which may cause electrical sparking.
- 6.2 The storage of tyres shall be in accordance with the Gulf standard mentioned in item 2.3.

7. SAMPLING

Four tyres with identical characteristics, e.g. size designation and service description or maximum load rating and speed capability, shall comprise a test sample:

- a) One tyre shall be used for the measurement of bead unseating resistance [for tubeless tyres] then of strength and then used for tensile strength and elongation test and for ageing test.
 - b) A second tyre shall be used for the endurance test.
 - c) A third tyre shall be used for the high speed performance.
 - d) A fourth tyre shall be used for the temperature rating.
- Each test sample shall conform to the requirements specified in ~~8.1 and 8.2.~~

8- TESTS

The following tests shall be carried out on samples taken in accordance with item 7.

- a. Visual inspection
- b. Measurement of dimensions
- c. Tensile strength and elongation
- d. Ageing
- e. Strength
- f. Endurance
- g. High speed performance
- h. Bead unseating resistance [for tubeless tyres]
- i. Temperature rating

9- METHODS OF INSPECTION AND TESTING

Tests shall be carried out in accordance with Gulf Standards [GSO 53/2017](#), [GSO 1783/2017](#), and [GSO 1784/2017](#) as mentioned in items 2.2, 2.3 and 2.4, respectively.

10- CRITERIA OF TECHNICAL CONFORMITY

- 10.1 Two months at least before dispatching the consignment of any type of tyres, the manufacturer shall send to the Standardization Organization for G.C.C. (GSO) in English and/or Arabic languages, certifying that this type of tyres meets the requirements of Gulf standard for tyres. The certificate shall include the following:
- 10.1.1 Designation of dimensions, construction, nominal tyre rim diameter and service description.
- 10.1.2 Tube type or tubeless.
- 10.1.3 The production period which shall not be more than one full year.
- 10.1.4 Trade name, trade mark, brand name or manufacturer's name.
- 10.1.5 Country of production.
- 10.1.6 A guarantee valid for at least one year.
- 10.1.7 Temperature rating
- 10.2 The results of tests carried out shall be supplied to GSO.
- 10.3 The tyres shall be exported within twelve (12) months from the date of production indicated on the tyre.
- 10.4 The approved conformity certificate shall be valid only for one year from the date of approval.
- 10.5 In case of GSO acceptance of the certificate mentioned in item 10.1, the type of tyres shall be considered acceptable.
- 10.6 In case the certificate is not accepted (because information is incomplete or subject to question), the information may be completed. If not completed or if necessary, substantiated tests, as required by GSO shall be carried out on tyre samples.

REFERENCES:

- 1) ECE No. 30 "Pneumatic Tyres (Passenger Vehicle)", Revision 3: 29th March 2007.
- 2) ECE No. 30 "Pneumatic Tyres (Passenger Vehicle)", Revision 3/Amendment 1. 10th November 2007.
- 3) ECE No. 30 "Pneumatic Tyres (Passenger Vehicle)", Revision 3/Amendment 2. 17th March 2010.
- 4) ECE No. 30 "Pneumatic Tyres (Passenger Vehicle)", Revision 3/Amendment 3. 27th January 2013.
- 5) ECE No. 30 "Pneumatic Tyres (Passenger Vehicle)", Revision 3/Amendment 4. 9th February 2017.
- 6) FMVSS No. 109 "New Pneumatic and Certain Specialty Tires". 2015
- 7) ISO 4223-1 "Definition of some terms used in tyre industry – Part 1: Pneumatic tyres"
- 8) ISO 10191 "Passenger car tyres – Verifying tyre capabilities – Laboratory test methods"